



LAUNCH OF CLEAN AIRSHIP 1 BEGINS A NEW ERA OF AIR POLLUTION RESEARCH

INTRODUCTION

The launch of Clean Airship 1 on December 5, 2000 outside Bakersfield, California was the kick-off to the most comprehensive air quality study ever done in California's Central Valley. **Tracer Environmental Sciences & Technologies** of San Diego has designed and built Clean Airship 1 (**Figure 1**), a remotely piloted blimp with advanced air monitoring capabilities.

Funding to build the 30-foot-long airship was by **Tracer ES&T**, the **U. S. Department of Energy (DOE)** and **Western States Petroleum Association (WSPA)**. DOE's contribution to the project was to provide funding for develop-



Figure 1 Pilot and lift off of Clean Airship 1.

ment of flight readiness, and a unique sampling and monitoring platform system.

The concept was that a highly maneuverable remotely piloted airship could provide an ideal platform capable of flight operations in the low surface layer of the atmosphere (0 to 1,000 ft). At these low altitudes the airship is designed to collect air quality data during the stagnant fog conditions common to the Central Valley in the winter months. Air quality data is collected and transmitted from the light-

weight platform to ground-based computers.

AIR QUALITY

The motivation for the Clean Airship was to meet air quality standards set by the **Environmental Protection Agency (EPA)**. The Clear Air Coalition a cooperative effort of California businesses, industries, agriculture and government agencies plans to bring the air quality of the Central Valley into EPA com-

cont'd on page 2

Inside Eye

DOE PROJECT AWARDS 5

IOGCC 9

NPTO JOINS NETL 10

CALENDAR 12



Figure 2 Map of the Central Valley of California where Clean Airship I will sample air quality.

pliance. Between 1988 and 1998, the number of days the southern portions of the Central Valley exceeded federal ozone standards fell by 47 percent, and the number of days that particulates exceeded standards fell by 90 percent. Research projects associated with the Coalition effort have funded \$44.5 million to improve the understanding of air pollution. The research area covers a wide area of California, concentrating sampling and modeling of air quality in the Central Valley (**Figure 2**). The Clean Airship effort joins six fixed-wing aircraft and monitoring and meteorological instruments at 185 stations operated by the California Air Resources Board to provide data to improve air quality.

The December 5th airship flight, (**Figure 3**) was made in connection with a planned release from a steam generator at Belridge oil field in the San Joaquin Valley near Bakersfield.

Aera Energy injected a tracer into the steam prior to release to allow analysis of where and how the steam plume is distributed in the atmosphere. The oil field selected offers easy access for the airship and ground-based controls, and is representative of the types of locations that can be monitored using the airship sampling technology.

During winter months, a low dense, very moist air layer, locally known as Tule Fog, blankets the Central Valley. The winter sampling phase will last from December 5, 2000 to the end of January 2001. One of the advantages of the airship is its ability to safely maneuver and collect samples during Tule Fog conditions. Because it is remotely controlled and operates at low levels, human pilots are not placed at risk during the sampling procedures.

AIRSHIP

The airship used for the emissions collection is a commercially available helium-filled blimp 30 feet long and 7.5 feet wide, tapering at either end. It is constructed of light weight special low-permeability laminated fabric. The airship is capable of lifting a maximum payload of up to 10 pounds. A glass-epoxy gondola shell attached to the bottom of the blimp contains the remotely controlled engines, two fuel tanks, and the platform with all navigation controls. The airship is capable of cruising for over an hour at speeds of 15 to 20 mph or for shorter periods up to 30 mph. The payload, a second gondola is mounted forward on the control gondola to hold the gas sampling equipment. The design for payload

specified all components to total less than 7 pounds for optimal operation. Power for the sampling equipment is provided by seven light-weight nickel metal hydride batteries.

The airship and sampling operation is designed to be highly portable to sites in southern California for air quality sampling. The deflated airship is transported by truck and can be inflated and ready to fly in less than one hour by a ground crew of three. The navigation and computer instrumentation for sampling is in a second truck. Tracer ES&T has two trained pilots experienced and certified in radio control aircraft.

RPATS NAVIGATION

For nearly 30 years, inert gaseous tracer materials have been used to study air pollution sources and distribution. Tracer ES&T has been a leader in the use of tracer materials to determine the emissions from atmospheric dispersion of ground-based pollution. Study of the vertical distribution of emissions was a challenge because airplanes could not fly during under the necessary conditions (low altitude and fog). Deployment of a dense network of moored balloons with adsorption tube samplers attached to tether lines would have been costly and lacked the flexibility to adapt to changing weather conditions. Tracer ES&T with DOE backing analyzed the needs and provided a solution.

The concept of a new type of sampling platform where vertical plume measurements could be taken in dense fog conditions at elevations less than 1,000 ft brought



Figure 3 Clean Airship I flying over the San Joaquin Valley.

about the development of a Remotely Piloted Airship for Atmospheric Tracer Sampling (RPATS). The RPATS system (**Figure 5**) was based on a commercially available radio controlled airship, the Global Positioning System (GPS) and real-time data analysis. The objective was to develop a system to measure plume concentrations as a function of downwind distance, horizontal location and height above ground. The two components of the system are the remotely piloted airship with a light weight sampling platform, and the GPS receiver and computer operation system on the ground. The system required both the airship, and the ground piloting and detection devices to be portable. **Figure 5** illustrates the small size and position of the engine, RPATS navigation equipment, and sampling devices.

SAMPLING TECHNIQUES

The goal is for the ground pilot to be able to locate an emissions plume and fly the airship cross-wind through the plume at various

altitudes and distances downwind collecting data and transmitting it back to the ground. **Figure 4** shows the relationship of the GPS satellite, the airship, and the portable ground station. A truck provides the ground based computers and radio control units.

The sampling platform carried by the airship required a light-weight gas monitor to measure ambient concentrations of sulfur hexafluoride (SF₆). A low-power pump delivers air samples to a catalytic reactor where the air is mixed with a small amount of hydrogen. This results in conversion of the sample to steam. The steam is condensed and a membrane collects the SF₆ concentration. A specially miniaturized electrometer amplifier conditions and amplifies the signal and routes it for digitization, and transmission to the ground computers. This sampling platform carried by the blimp

cont'd on page 4

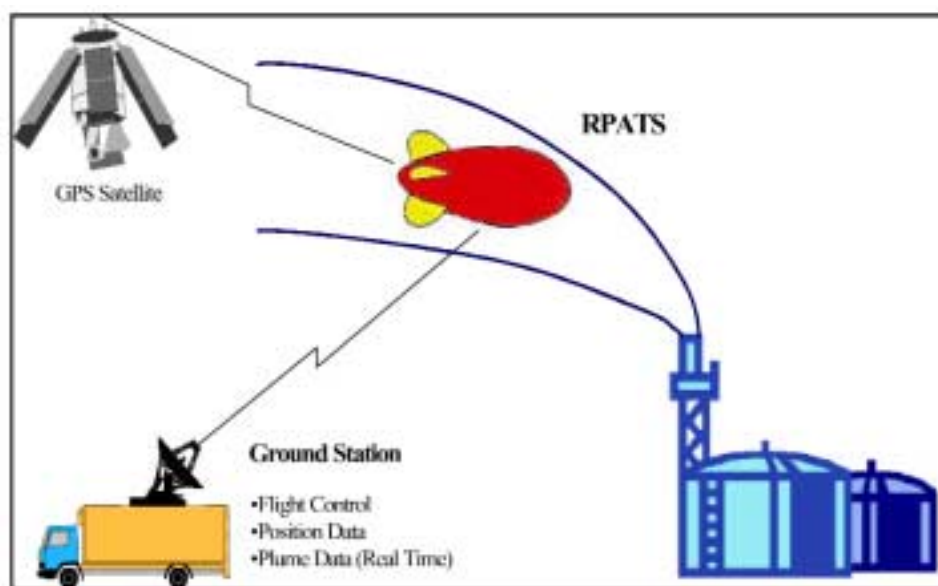


Figure 4 Schematic of the relationship of GPS satellite, airship, and ground tracking equipment.

cont'd from page 3

is capable of operation at slower speeds and lower altitudes than would be possible or allowable utilizing full-sized aircraft.

CONCLUSIONS

Development of the Clean Airship is an excellent example of cooperative efforts by private industry and federal and state government agencies to improve the air quality. The airship was designed and tested in California's Central Valley to demonstrate the effectiveness of a remotely piloted low altitude sampling device in foggy and overcast weather conditions. The design met rigid specifications for global positioning navigation, maximum sampling capabilities, computer relays, and minimum weight instrumentation to be carried in the small platform beneath the 30-foot blimp. Initial sampling flights in December 2000 have successfully provided data on air currents and air quality in the Bakersfield, CA area.



Figure 5 RPATS in flight-ready status.

Environmental Team Members

David Alleman

Phone:

Email:

NPTO

918/699-2057

dalleman@npto.doe.gov

Nancy Comstock

Phone:

Email:

NPTO

918/699-2059

ncomstoc@npto.doe.gov

John Ford

Phone:

Email:

NPTO

918/699-2061

jford@npto.doe.gov

Environmental Program Manager

William Hochheiser HQ

Phone:

202/258-5614

Email:

William.Hochheiser@hq.doe.gov

Nancy Johnson

Phone:

Email:

HQ

202/586-6458

nancy.johnson@hq.doe.gov

DOE SELECTS SEVEN ENVIRONMENTAL PROJECTS

As part of its program **(Improve Environmental Compliance in Oil, Gas Operations)** to find effective ways to guard the environment while reducing costs in the nation's oil and gas fields, the U.S. Department of Energy is adding seven new projects in fossil energy research. In all, the Energy Department plans to provide \$4.4 million in federal funding to the projects, which will be combined with \$2.3 million in private sector cost-sharing. The projects will be overseen by the Energy Department's Tulsa-based **National Petroleum Technology Office (NPTO)**, a branch of the **National Energy Technology Laboratory**.

Program Contact:

Herbert A. Tiedemann, National Petroleum Technology Office,
918-699-2017, e-mail:
htiedema@npto.doe.gov

Environmental Program Contact:

Nancy Comstock, National Petroleum Technology Office,
918-699-2059, e-mail:
ncomstoc@ntpo.doe.gov

NEW PROJECTS

Arthur Langhus Layne - LLC, Tulsa, OK, will receive a grant to examine how recent advances in geographic information systems (GIS) technologies can be applied to reduce environmental concerns when natural gas is produced from coalbeds in Montana.

Arthur Langhus Layne in conjunction with **Montana Board of Oil & Gas Conservation**

(MBOGC), the U. S. Bureau of Land Management and other governmental agencies will examine current environmental concerns and coalbed methane production practices in the Montana portion of the Powder River Basin, and investigate how recent advances in Geographic Information Systems technologies can be applied as mitigation aids.

Project benefits from successful conclusion of the project include continued success of affordable coalbed methane production in Montana and other areas throughout the U.S., along with improved environmental protection, better decision making, and a framework from which other state and federal agencies can design and implement similar technologies.

The project contact is J. Daniel Arthur, 918-382-7581. The DOE contact is John Ford, 918-699-2061, e-mail: jford@npto.doe.gov



Energy Education Partnership, Inc., Oklahoma City, OK, will develop a pilot training program for operators, regulators and emergency response teams to handle oil and gas facility fires, explosions and other emergencies.

The **Energy Education Partnership, Inc. (EEPI)**, a subsidiary of the **Interstate Oil and Gas Compact Commission**, will

develop an Oil and Gas Facility Emergency Awareness Program as a pilot program that will provide owners and operators of oil and gas facilities, emergency response teams, and regulators with training in how to protect the land prior to an emergency, and how to handle an emergency, should one occur.

A guidebook, based on the Ohio Oil and Gas Energy Education Program's Responding to Oilfield Emergencies handbook, will be created as the basis for a training class and as a handbook for emergency responders. A class providing training for facility owners and operators in the correct method of handling a fire, explosion or hazardous substance will then be developed as a visual presentation and made available to all interested parties. Emergency responders will be familiarized with typical materials, regulations, equipment and hazardous substances. A 30-40 minute video will be prepared using materials from the book and the class agenda, including pictures of actual well sites.

The presence of well-trained personnel involved in the production of oil and gas, and responders who know how to handle a fire or hazardous substance release will enable a safer, cleaner, less costly oil and gas industry and more efficient management of the environment and the health and safety of the public.

The project contact is Barbara

cont'd from page 5

Skelton, 405-525-3556, Ext 107.
The DOE contact is David
Alleman, 918-699-2057, e-mail:
dalleman@npto.doe.gov



Gnomon, Inc.

Gnomon, Inc., Carson City, NV, will develop a model approach for making more rapid decisions about relocating oil and gas wells away from archeological, historical or other sites with cultural significance.

Gnomon, Inc., will address the issue of "cultural resources," archeological or historical sites, materials and artifacts whose presence in areas of potential fossil fuels development necessitates compliance with relevant state and federal regulations governing their care and protection. A typical cultural resources assessment comprises a records search, intensive field work, a preliminary report to a public land agency, possible requirements for additional fieldwork, project design changes, further agency review, eventual issuance of permits - a slow and expensive process. Gnomon proposes to establish a new mode of on-the-ground development that is cognizant of cultural resource values and provides awareness of the risk of delaying or adding to the expense of a project.

Gnomon will conduct a geomorphic, archeological and historical study of an area in Pine Valley, compile a comprehensive electronic database of the area's archival field

data, create a risk model for land development related to oil and gas exploration, drilling or collection within the study area. The model will involve industry in the process of creating the appropriate cultural resource management tools.

The model will give regulators the ability to make faster and better permit decisions should provide more rapid access to public lands for oil and gas operations, and streamline regulation compliance by making the process swifter and more open. The project contact is Eric Ingbar, 775-885-2305. The DOE contact is Nancy Comstock, 918-699-2059, e-mail:
ncomstoc@npto.doe.gov



University of Tulsa, Tulsa, OK, will employ risk assessment techniques to gauge the likelihood of damage to soil ecosystems from spills of produced fluids such as oil and brine, identify spill causes, and determine appropriate clean-up standards.

The University of Tulsa (TU) will pursue a two-part project involving both pollution prevention and remediation on oil production in the **Tallgrass Prairie Preserve**, Osage County, Oklahoma. The Preserve contains over 100 wells producing about 15-20 barrels of oil per day and as much as 10 times that volume of brine. The oil infrastructure in this field is aging and requires maintenance, increasing the risk of environmental damage

should an equipment failure occur. Operators of these marginally producing fields have limited resources for environmental protection, making it important that such protection be as cost effective as possible.

TU's researchers will employ probabilistic risk assessment (PRA), a consistent, logical and scientifically defensible approach to risk minimization in exploration and production operations, to quantify the likelihood of certain outcomes and identify the events that lead to these outcomes. TU will examine the equipment used in each production system in the Preserve - well heads, pumps, gathering lines, oil-water separators, tank batteries, re-injection wells - and analyze and model the results to assess the risk of accidental release of produced fluids. The validated models can be used by environmental managers to allocate resources in a manner that will, over time, reduce adverse impacts by minimizing the occurrence of such undesired events.

PRA risk control comprises identification and evaluation of risk mitigation options. Spills that occur must be remediated or "cleaned" to restore the impacted land and prevent further contamination. But how clean is clean? The lack of science-based information applied to such concerns can lead to overly conservative and costly eco-based regulations. TU researchers will study the effects of crude oil and brine spills on grasslands soil ecology to define appropriate endpoints for remediation. The results will contribute to the development of practical, appropriate, cost-effective and technically defensible strategies

for management of accidental spills of produced fluids and make for better use of limited resources.

The project contact is Kerry Sublette, 918-631-3085. The DOE contact is Nancy Comstock, 918-699-2059, e-mail: ncomstoc@npto.doe.gov

The **Ground Water Protection Research Foundation (GWPRF), Oklahoma City, OK**, will further deploy a personal computer-based data management tool - known as the Risk-Based Data Management System - that state agencies can use to make better regulatory decisions. The Foundation will also enhance the system to incorporate additional data from oil and gas fields, and it will begin a 3-state project to collect environmental data on hydraulic fracturing of coal beds.

This three-task project will (1) extend GWPRF's PC-based oil and gas regulatory data management system to additional state agencies, (2) collect peer-reviewed data on environmental implications of hydraulic fracturing of coal beds, and (3) establish a national conference on water re-use.

GWPRF's first task is the installation of the Risk Based Data Management System (RBDMS) in all state oil and gas agencies that desire the system. Under this project, GWPRF will install or upgrade the generic version of RBDMS for oil and gas state agencies, including requests from North Dakota, Florida, Alaska, West Virginia and Illinois. GWPRF also has RBDMS utilities that were developed to

work with individual state-developed data management systems, such as that requested by Colorado.

GWPRF is developing RBDMS documentation and manuals to help train and maintain system personnel in states experiencing a turnover in skilled RBDMS operators. GWPRF also maintains a help desk that reduces or eliminates the need for costly on-site visits.

In Task 2, GWPRF will provide enhancements to the RBDMS system, including an online well permitting system, field inspection scheduling and reporting, down- and uploading data from and to state agency databases, and many other Internet connections for acquiring various useful data.

In Task 3, GWPRF will initiate a three-state peer review project, collecting information concerning environmental considerations on hydraulic fracturing of coal beds and its potential effects on sources of drinking water. It will also establish a focus group to develop the framework for a national conference dealing with water re-use and limited water resource issues pertaining to oil and gas activities.

The project contact is Ben Grunewald, 405-516-4972. The DOE contact is David Alleman, 918-699-2057, e-mail: dalleman@npto.doe.gov



TDA Research, Inc., Wheat Ridge, CO, will field-test a process

for removing sulfur contaminants from natural gas that could prove to be much less complex and lower in cost than conventional cleanup technologies. Environmental regulations require that 97% or more of the sulfur must be removed, which requires complex processes that are costly, particularly for small capacity plants.

TDA Research will test its Direct Oxidation Process, which uses a catalyst (developed by TDA under a separate DOE program) to partially oxidize hydrogen sulfide to sulfur and water, without the formation of substantial amounts of the contaminant sulfur dioxide. TDA will lease a pilot plant from the Gas Research Institute and, in collaboration with URS Radian, install it at the NorthStar Energy field site in Alberta, Canada. Norton Chemical Process Products Corporation will assist in the testing and manufacture of the one-ton batch of catalyst.

TDA and Radian will perform the baseline and long-term testing, along with an evaluation of the economics of the process and comparison of the data with other state-of-the-art small-scale sulfur recovery technologies. Although the catalyst has had over 600 hours of laboratory testing, catalyst stability data using an actual slip stream from a gas-processing plant is crucial to determining the reliability of the process on a commercial scale. A successful field test will allow TDA to offer a low-cost, compact and efficient sulfur removal process for effluent amine gas to the gas industry worldwide.

cont'd from page 7

The project contact is Dr. Girish Srinwas, 303-940-2321. The DOE contact is Nancy Comstock, 918-699-2059, e-mail: ncomstoc@npto.doe.gov



Interstate Oil & Gas Compact Commission, Oklahoma City, OK, will expand a variety of ongoing environment-related projects with the oil and gas producing states, including technical and training assistance, regulatory streamlining, data management standardization and dialogue on regional oil and gas issues.

The **Interstate Oil & Gas Compact Commission (IOGCC)** will continue and expands projects, which assist the states in the orderly development of oil and natural gas resources focusing on technical and training assistance, regulatory streamlining, data management standardization and dialogue on regional oil and gas issues.

The IOGCC assists states in achieving uniformity in Information Technology and maximizing accessibility of state data, and promotes opportunities for states to exchange technology and obtain access to expert guidance. The IOGCC Web page will provide an important, easily accessible source for state data compiled into national figures and information. Expanding remote Internet access for accomplishing

routine oil and gas business, such as Texas' online well permitting system, will shorten the time and reduce the cost of these procedures.

Regulatory Streamlining work will focus on eliminating duplicative, overlapping requirements of state and federal government programs, enabling the transfer of federal regulatory authority to the states, and educating current and future federal and state policy makers in oil and gas issues. Dialogue will continue with the **Environmental Protection Agency** to provide the public with information regarding waste disposal without imposing undue hardship on the industry. Regulatory standards, guideline and models will be developed on a wide variety of concerns, and the IOGCC will continue building partnerships with national environmental issues.

Participation of the Appalachian-Illinois Basin Directors in IOGCC activities will be expanded to further the long-range goals of state and federal regulators in the region. Workshops will be held with the North American Coastal Alliance on environmental topics of interest to U.S. coastal states and Canadian provinces. The IOGCC's commitment to provide the public with a more balanced viewpoint concerning oil and gas will be advanced by educating state and federal policy makers about energy-related issues, informing the public of economic contribution of the domestic petroleum industry, and developing a public television documentary covering these and other issues.

The project contact is Barbara Skelton, 405-525-3556, Ext 107. The DOE contact is David Alleman, 918-699-2057, e-mail:

dalleman@npto.doe.gov 

EYE on Environment

features oil and gas related projects implemented through DOE's oil and gas environmental research program.

DOE contacts at the **National Petroleum Technology Office** are:

Herb Tiedemann
918-699-2017
Email: htiedema@npto.doe.gov

Nancy Comstock
918-699-2059
Email: ncomstoc@npto.doe.gov

Acknowledgments

Editor
Viola Rawn-Schatzinger
RMC Consultants, Inc.
918-699-2018
Email: vschatzi@npto.doe.gov

U.S. Department of Energy
**National Energy
Technology Laboratory
National Petroleum
Technology Office**
One West Third Street
Tulsa, OK 74103-3519



DOE AND IOGCC ANNOUNCE NORM TECHNOLOGY CONNECTION

The **U.S. Department of Energy (DOE)** and **Interstate Oil and Gas Compact Commission (IOGCC)** have launched the **NORM Technology Connection** website. This website provides the petroleum industry with streamlined access to information that previously was difficult or time-consuming to obtain.

NORM is produced when oil and natural gas from underground reservoirs carry small quantities of radium to the surface. Over time, the radium, typically radium-226 and to a lesser extent, radium-228, can concentrate in pipe scale and oil sludge. These scales and sludges can contaminate soils and equipment. The presence of NORM in concentrations that exceed natural background levels may present a potential human health risk.

As a result, managing and disposing of NORM-bearing wastes has become a significant issue for some oil and gas operators. Operators face the challenge of ensuring NORM-bearing wastes are handled in accordance with state regulations, yet at the lowest possible cost.

The NORM Technology Connection website is intended to help the industry meet

this challenge by allowing operators to identify and obtain the applicable regulations, determine what commercial services are available, and communicate with others who have relevant experience and knowledge. **Figure 6** shows the menu bar provided by the NORM website.

A key component of the NORM Technology Connection website provides access to information about the regulation of NORM, including a state-by-state directory of agencies that have jurisdiction over petroleum industry NORM. For each agency, contact information is provided and existing regulations applicable to petroleum industry NORM (if any) are identified. Where available, links

to state agency websites and to online copies of the applicable regulations are provided.

Another main component of the NORM Technology Connection website is a database of information about companies that provide various NORM services, such as site characterization and remediation support, sample collection and analysis, equipment cleaning/reconditioning, radiation safety program development, radiation safety and NORM training, NORM waste treatment and disposal, and general consulting.

Users can search the database to find companies providing a specific type of service - for example, to find all NORM dis-

cont'd on page 10

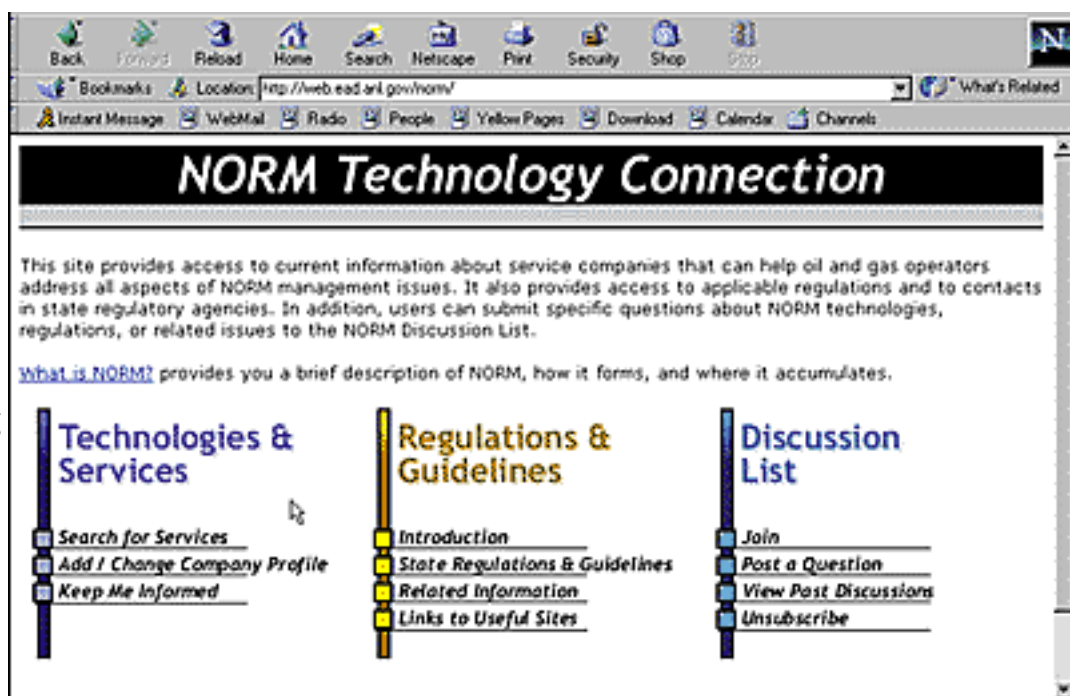


Figure 6

This is the homepage for the website. It will be edited slightly in the coming weeks.

cont'd from page 9

posal companies - or to find companies providing services within their state. Company-specific information profiled on the website includes current contact information plus a brief description of the companies capabilities. If available, email addresses and a link to the companies own website also are provided.


Individual companies are responsible for the accuracy and completeness of the information posted on the website. Company participation is free, meaning that any company wishing to post information about itself will be able to do so at no charge. Similarly, public access to the website also is free.

A third component of the website is a discussion forum within which individuals can post and respond to specific questions related to NORM management. The discussion forum is served by a mail list and individuals may subscribe and unsubscribe at any time.

The NORM Technology Connection website is available at <http://www.iogcc.state.ok.us/NORM>. The website was developed by Argonne National Laboratory's Environmental Assessment Division, with funding from the DOE's National Petroleum Technology Office in Tulsa, Oklahoma.

Technical contacts: John Ford, DOE National Petroleum Technology Office, 918-699-2061, email: jford@npto.doe.gov

Karen P. Smith, Argonne National Laboratory, 303-986-

1140 (ext. 267), email: smithk@anl.gov 

National Petroleum Technology Office joins the National Energy Technology Laboratory

On November 1, 2000, the U.S. Department of Energy's primary field office for petroleum technology in Tulsa, Oklahoma, became part of the agency's national laboratory complex as an arm of the recently created National Energy Technology Laboratory. Energy Secretary, Bill Richardson made the announcement on November 1st. Richardson said he was taking the action to "elevate the status of department's petroleum research program."

"The future of our domestic petroleum industry will be determined largely by technology, and it is important that we streamline the coordination throughout our research complex in developing advances that can benefit our domestic producers," Richardson said.

Previously, the Tulsa office, the **National Petroleum Technology Office (NPTO)** operated as a separate part of the Energy Department's Fossil Energy organization. With the new change in reporting relationships, the office will report to the **National Energy Technology Laboratory (NETL)** located in Morgantown, WV, and Pittsburgh, PA. NETL was designated last December by Richardson as the nation's 15th national laboratory and is the Energy Department's primary fossil fuel research center. Part of its organization includes a new Strategic Center for Natural Gas, which will oversee a wide range of natural gas related activities.

The 26 employees at NPTO will remain in Tulsa and will continue to be the lead site for coordinating the Energy Department's oil technology program. Integrating the petroleum office into the National Energy Technology Laboratory also will give petroleum specialists in Tulsa more immediate access to the Laboratory's onsite research facilities and its research support capabilities.

For more information, contact:
Robert C. Porter, Office of Fossil Energy, 202/586-6503,
Email: robert.porter@hq.doe.gov



For a free subscription to the **Eye on Environment** or any of the other DOE newsletters, of if you would like back issues, please contact Herb Tiedemann, phone 918/699-2017 or email: htiedema@npto.doe.gov

The **Eye on Environment** is a bi-annual newsletter published since 1995, highlighting environmental projects sponsored by the U.S. Department of Energy and managed through the National Petroleum Technology Office of the National Energy Technology Laboratory.

The **Class Act**
Highlights of the DOE's Reservoir Class Program

Eye on Environment
DOE's Oil & Gas Environmental Research Program

Inside Tech Transfer
A technology transfer newsletter published by the National Petroleum Technology Office

Downstream Details
The National Petroleum Technology Office's Downstream Projects

The Publications List
Computer Software, Supporting Documentation, Reports, and more!

The Class Act DOE's Reservoir Class Program Newsletter Winter 2000

U.S. Department of Energy • National Petroleum Technology Office • P.O. Box 610 • Tulsa, OK 74120-0610

Significant New Learnings From an Integrated Study of an Old Field, Foster/South Cowden Field (Grayburg/San Andres), Ector County, TX

By Robert Tiedemann, Laura Tiedemann, and Robert Tiedemann

LEARNINGS

It was anticipated that the successful integration of seismic data with a reservoir simulation would be the major contribution of this study. There are, however, a number of other engineering, geological and geophysical "learnings" that have come out of this study.

WATER CHEMISTRY

Water chemistry analysis can describe differences and changes in the reservoir in this 40-year-old field.

What's Inside

Volume 1	4
Volume 2	8
Volume 3	12
Volume 4	16
Volume 5	20
Volume 6	24

Figure 1: Foster #11, one of the successful wells.

Inside Tech Transfer Winter 2000/2001

A technology transfer newsletter published by the Department of Energy's National Petroleum Technology Office

In this issue Forefront

4 "Breakthrough Technology" Product of DOE-Industry Project; New Wireline Logging Tool Available to Industry

Tech Focus

5

Who's Who

7

Resources

8

1995: A "breakthrough technology" made possible by the Department of Energy (DOE) through a grant to a Seattle-based engineering firm, **Development Engineering, Inc.** in 1994, is now available to the oil and gas industry through commercial service companies. The device developed by the small firm in cooperation with DOE, OIL and a consortium of industrial companies measures formation permeability behind the mud cake during oil "through the pipe" operations.

1996: DOE and industry have developed a new wireline logging tool that can be used to measure permeability behind the mud cake during oil "through the pipe" operations.

1997: DOE and industry have developed a new wireline logging tool that can be used to measure permeability behind the mud cake during oil "through the pipe" operations.

1998: DOE and industry have developed a new wireline logging tool that can be used to measure permeability behind the mud cake during oil "through the pipe" operations.

1999: DOE and industry have developed a new wireline logging tool that can be used to measure permeability behind the mud cake during oil "through the pipe" operations.

2000: DOE and industry have developed a new wireline logging tool that can be used to measure permeability behind the mud cake during oil "through the pipe" operations.

2001: DOE and industry have developed a new wireline logging tool that can be used to measure permeability behind the mud cake during oil "through the pipe" operations.

Downstream Details NPTO's Downstream Projects Newsletter Fall 2000, Vol. 1, No. 1

Hot Off the Press!

Metal Oxides Could Help Lower Sulfur in Cat-Cracked Gasoline

The U.S. Environmental Protection Agency (EPA) has mandated that by the year 2002, the sulfur content in gasoline be less than 30 ppm.

Contents

1. Barrels Remove Sulfur from Heavy Crude Oils: A joint effort by the DOE and industry has resulted in the development of a new process for removing sulfur from heavy crude oils.
2. City Compliance: Support HDS Catalyst: A new catalyst for HDS (Hydrodesulfurization) has been developed by DOE and industry.
3. NPTO Research Helps: Provide Science Behind EPA's Sulfur Regulations on Small Particle Emissions: A new study by NPTO researchers has provided the science behind the EPA's sulfur regulations on small particle emissions.
4. Real-Time In-Situ: Measurement of Elemental Composition in Glasses and Aerosols: A new method for measuring the elemental composition of glasses and aerosols in real-time has been developed by DOE and industry.
5. Calendar: Make your plans now!

DOE's Oil & Gas Environmental Research Program Winter 2000, Vol. 1, No. 3

LAUNCH OF CLEAN AIRSHIP 1 BEGINS A NEW ERA OF AIR POLLUTION RESEARCH

By John Koenig, NPTO, Consultant, Inc.

INTRODUCTION

The launch of Clean Airship 1 on December 5, 2000 marks the kick-off to the most comprehensive air quality study ever done in California's Central Valley. The launch of Clean Airship 1, a recently piloted aircraft, will provide the first direct measurements of air quality in the Central Valley.

Figure 1: Pilot and lift of Clean Airship 1.

Inside Eye

DOE PROJECT ANNOUNCES

IOGCC

NPTO KING NETL

CALENDAR

Air Quality

The motivation for the Clean Airship was to meet air quality standards set by the Environmental Protection Agency (EPA). The Clean Airship is a cooperative effort of California businesses, industries, agriculture and government agencies plan to bring the air quality of the Central Valley to the highest level.

United States Department of Energy
National Energy Technology Laboratory
National Petroleum Technology Office

List of NPTO Publications

Computer Software, Supporting Documentation, Reports, and more!

Your source for information on DOE-funded Research and Development Projects.

Find us on the web at <http://www.npto.doe.gov>

U.S. Department of Energy
National Energy Technology Laboratory
National Petroleum Technology Office
Attn: Herbert A. Tiedemann
One West Third Street
Tulsa, OK 74103-3519

PRESORTED
STANDARD
U.S. POSTAGE
PAID
PERMIT NO. 432
TULSA OK

Official Business
Penalty for private use \$300



C a l e n d a r

February

Jan. 30-Feb. 1, 2001, NAPE® Expo,
Houston, TX.
George R. Brown
Convention Center
www.napeonline.com

**Feb. 26-28, 2001, SPE/EPA/DOE Exploration and
Production Environmental Conference,**
San Antonio, TX.
Hilton Palacio del Rio Hotel
www.spe.org

March

Feb. 28-Mar. 2, 2001, PERF, *Quarterly Meeting*,
San Antonio, TX.
Hosted by Petro-Canada
www.perf.org

**Mar. 25-27, 2001, Ground Water Protection
Council, *2001 Annual Policy Meeting*,**
Alexandria, VA.
Sheraton Suites
www.gwpc.org